WHAT IS CLAIMED IS:

1. A method of measuring temperature in stationary components of electrical machines using fiber optics, the method comprising:

(a) embedding an optical fiber in a non-metallic ribbon;

(b) cutting notches in the ribbon to effect bends that accommodate a shape of a stationary component;

(c) attaching the ribbon and optical fiber to the stationary component;

(d) injecting a series of laser pulses from at least one end of the optical fiber; and

(e) monitoring stationary component temperature by interrogation of reflections from the series of laser pulses.

2. A method according to claim 1, wherein the stationary component is an armature bar, and wherein insulation is provided surrounding the armature bar, and wherein step (c) is practiced by attaching the ribbon and optical fiber on an outside of the insulation.

3. A method according to claim 1, wherein the stationary component is an armature bar, and wherein step (c) is practiced by attaching the ribbon and optical fiber directly to the armature bar.

4. A method according to claim 1, wherein step (a) is practiced by arranging the optical fiber embedded in the ribbon in a sinusoidal configuration.

5. A method according to claim 1, wherein step (d) is practiced by injecting the series of laser pulses from both ends of the optical fiber.

6. A method according to claim 1, wherein insulation is provided surrounding the stationary component, and wherein step (d) is practiced by injecting the series of laser pulses through the insulation at a low voltage end of the windings close to a neutral end of the windings.

7. A method according to claim 1, wherein the stationary component is an armature bar, and wherein step (c) is practiced by routing the optical fiber on a multi-circuit winding having an even number of circuits (2N) by routing the optical fiber as a single series connected path, proceeding up one circuit and returning on the other N times.

8. A method according to claim 1, wherein the stationary component is an armature bar, and wherein step (c) is practiced by routing the optical fiber on a multi-circuit winding having an odd number of circuits (2N+1) by routing the optical fiber as a single series connected path, proceeding up one circuit and returning on the other N times, with routing on the remaining unpaired circuit being both out and back along the same bars.

9. A method according to claim 1, further comprising routing the optical fiber out of the machine along connection leads, thereby enabling the series of laser pulses to be applied external to the machine.

10. A method according to claim 1, wherein step (c) is practiced by attaching at least a second ribbon and a corresponding second optical fiber to the stationary component.

11. An apparatus for measuring temperature in stationary components of electrical machines, the apparatus comprising an optical fiber embedded in a non-metallic material ribbon, wherein notches are formed in the ribbon to accommodate bends in a stationary component, and wherein the ribbon is formed of a material with sufficient creep strength to support the optical fiber while preventing the optical fiber from being crushed.

12. An apparatus according to claim 11, wherein the optical fiber is embedded in the ribbon in a sine wave configuration.

13. An apparatus according to claim 12, wherein the notches coincide with nodes of the sine wave.

14. An apparatus according to claim 11, further comprising a second ribbon and a corresponding second optical fiber.

15. An apparatus according to claim 11, wherein the stationary component is an armature bar, and wherein a height of the ribbon is about one half a height of the armature bar.